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Notes on the North American Species of Eriocauleæ.

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This order is sparsely represented in North America, consisting in fact only of a few outlying members of a tropical family. A single species only is found as far north as Canada, the greater number occurring in the warm sections of the United States. The genus *Lachnocaulon*, however, is endemic in our country, and therefore has a special interest for us. The great bulk of the family is confined to South America, where three-quarters of the three hundred and twenty-five species embraced in it occur. Our own species have been imperfectly investigated and poorly defined, and for this reason the present paper has been prepared in the hope that something may be contributed towards a better understanding of their characters and geographical distribution.

In general aspect these plants may be easily recognized, being very peculiar. The flowers are androgynous or dicœcious and contained in more or less hemispherical heads which are enclosed by involucral scales as in the Compositæ. In the place of growth they favor swampy grounds or shallow water, but a few grow in low sandy barrens or fields. In mode of growth they are cæspitose, and new tufts of leaves are added year by year to the stock so that in time quite a little colony is collected about the same caudex, from which scapes, sometimes very numerous, are annually sent up. The scapes are nearly always twisted in the growth, and always marked longitudinally by angles, which are frequently interrupted by intermediate ridges or striæ. As these intermediate ridges are often partial, the number of angles assigned to a scape will vary with the point

at which the number is reckoned. This will account for the discrepancy which occurs in the statements of different observers. The large roots are spongy or often conspicuously nodose for their whole length. With three of the genera we have no concern, as two of them, *Philodice* and *Tonina*, both together numbering five species, are restricted to tropical South America, and the other, *Mesanthemum*, numbering three species, is endemic in tropical Africa.

The North American genera may be briefly distinguished as follows:

Segments of the perianth four or six.

Stamens separate. Anthers two-celled. Stamens as many as the perianth segments. 1. *Eriocaulon.*

Stamens one-half as many as the perianth segments. 2. *Dupatya.*

Perianth of three segments. Stamens three, monadelphous below. Anthers one-celled. 3. *Lachnocaulon.*

Eriocaulon is the most extensively diffused genus, being found in tropical and subtropical regions throughout the world. As classified by Körnicke in his monograph the species are divided into fourteen sections. All the species occurring within the borders of the United States, so far as known, are acaulescent or nearly so, the heads single on erect peduncles or scapes, the perianth with one exception four-parted and the stamens four; the Mexican species are the same except in having six-parted flowers and six stamens. The perianth segments, at least the upper ones, are usually spotted with a minute black gland near the centre or the apex. The heads are generally quite villose and grayish in appearance, the parts of the perianth being strongly bearded. The flowers are each subtended by a bract quite similar in markings and general appearance to the perianth segments. Seeds oval, brown when mature and, under the lens, covered with blunt or spiny protuberances.

As the perianth segments are in two series and often separated at a considerable distance, there is much variation in the language applied to them by botanists. Körnicke calls the floral envelopes a double perigonium, the exterior calyculate and interior subcorolline. Kunth speaks of them as a double calyx, while others

still regard them as calyx and corolla. The segments of the two series are alternate with each other, sometimes one or both pedicellate or tubular below, sometimes free and separate, often partially or wholly connate.

The floral appendages of these plants constitute a morphological feature of great interest. In *Eriocaulon* the appendage of the staminate flower appears like a style included in and coalescent with the tube of the inner segments, projecting between the bases of the stamens in three small black points which look much like the segmental glands. I do not find this in the pistillate flower. In *Dupatya* and *Lachnocaulon* the appendages are more marked. In the staminate flower they stand up in two or three distinct lobes which are often papillose. In the pistillate flower they are attached to the style in or below the sinuses of the stigmas, apparently enclosing and cohering with the style. Nearly all the botanists who have noticed these appendages regard those of the staminate flowers as rudimentary pistils. Kunth considers them so in both kinds of flowers, but most botanists are content to call those of the fertile flowers merely appendages.

Of the following species seven occur in the United States and five in Mexico, of which two are more particularly described as they approach our boundary near enough to render it probable that sooner or later they will be detected on this side of the border.

1. ERIOCAULON ARTICULATUM (Huds.).

Nasmythia articulata, Huds. Fl. Ang. Ed. 2, i, 415 (1778).
E. pellucidum, Mx. Fl. ii, 166 (1803).
E. septangulare, With. Ar. Br. Pl. ii. 257. (1818); Torr. Bot. N. Y. ii. 335 (1843), and other American authors.

Stem a mere crown. Leaves pellucid, three to eight nerved, fenestrate, acuminate, ½ to 3 inches long, usually equal to the sheaths. Scapes weak, commonly twisted, about seven-angled, smooth, mostly from 4 to 8 inches in height, but sometimes scarcely one inch, and when submersed often elongating till they are from 4 to 10 feet long, usually solitary but occasionally clustered. Involucral scales smooth or the innermost bearded at the apex, oblong, obtuse, entire, scarious, of a livid or fuscous tint, usually shorter than the flowers. Heads androgynous, the

marginal flowers usually staminate. Bracts cuneate or obovate, abruptly pointed, fuscous above and white bearded, receptacle smooth, flowers about 1¼ lines high, the outer sterile perianth tubular below and its lobes at some distance from the inner, all bearded at the apex. The gland is borne sometimes on the bract and both pairs of segments, and sometimes only on the upper pair. One of the upper pair is generally larger than the other. Fertile flowers scarcely more than half the size of the sterile, the pairs of perianth segments without a tube, and much nearer together than the sterile, all densely bearded.

Still, shallow water, ponds and streams, Newfoundland to Ontario, New England and Minnesota, south to Florida and Texas. Occurs in Great Britain. July to October.

2. ERIOCAULON COMPRESSUM, Lam.

E. compressum, Lam. Encyc. iii. 276 (1789); Körnicke, Linnæa, xxvii. 592 (1854).

E. gnaphalodes, Mx. Fl. ii. 165 (1803), and American authors generally.

Leaves coarsely or finely six to twenty fenestrate-nerved, usually shorter than the sheaths, tapering to a long, sharp point, rigid, or when submerged thin and pellucid, scapes 6 to 35 inches high, smooth, more or less compressed when dry, ten to twelve angled. Involucral scales rounded, obtuse, scarious, shining, smooth, imbricated in three or four rows, heads frequently dioecious, 3 to 6 lines in diameter. Receptacle smooth. Flowers 1½ to 2 lines high. In other respects like the preceding species.

In anthesis the styles and stigmas are much exserted, standing above the heads like projecting threads. The sheaths are obliquely fissured, obtuse at the point, veined like the leaves.

In still, shallow water, ponds and streams, New Jersey to Texas. Cuba. May to October.

3. ERIOCAULON DECANGULARE, L.

E. decangulare, L. Sp. Pl. 87 (1753).

Caudex short and thick, from one to two inches long. Leaves finely many-nerved, or often apparently nerveless, ensiform, tapering to a blunt point, usually much longer than the sheaths, 6 to 20 inches long and 2 to 8 lines broad. Scapes

stout, rigid, smooth, ten to fourteen-angled, 1 to 3 feet high. Heads 4 to 8 lines in diameter. Involucral scales ovate, often eroded, dentate at the apex and hairy below. Receptacle hairy, the hairs under the microscope many-celled, appearing acute at the apex or very rarely club-shaped. Flowers about 2 lines high, densely woolly at the base, the bract larger than the flowers acute, white-bearded. Perianth segments spatulate, white-bearded.

Swamps, New Jersey and Pennsylvania to Florida and Texas. Cuba. June to October.

4. ERIOCAULON RAVENELII, Chapm.

E. Ravenelii, Chapm. Fl. 503 (1860).

Very smooth throughout. Leaves linear, very acute, flat, thick or thin and pellucid, finely five to ten-nerved, somewhat longer than the sheaths. Scapes slender, 4 to 5 inches high, clustered, five to six-sulcate. Sheaths obliquely fissured, acute, nerved like the leaves. Heads 1 to 2 lines in diameter. Involucral scales scarious, light straw-colored, oblong, very obtuse. Bracts a little narrower than the scales, often obtusely pointed and denticulate, fuliginous. Flowers scarcely more than ½ line high, fuscous, smooth. Segments of the outer fertile perianth separate, very slender, mucronately pointed; of the inner somewhat broader, minutely toothed. Ovary sessile; style parted into two stigmas. Chapman states that the style is occasionally simple and the seeds minutely pubescent. The specimens which I have examined failed to show either.

Wet grounds, S. C.

5. ERIOCAULON TEXENSE, Körn.

E. Texense, Körn. Linnæa, xxvii. 595 (1854).

Scapes smooth, 8 to 10 inches high, six to seven-sulcate, slender, in the specimens examined solitary. Leaves acuminate, many-nerved, fenestrate, flat, smooth, 1 to 2 inches long, a little shorter than the sheaths. Roots fibrous, the larger ones nodose. Heads hemispherical, 1 to 2 lines in diameter. Involucral scales obovate or nearly orbicular, smooth, entire, straw-colored. Receptacle pilose with silky hairs. Bracts as long as the flowers, cuneate or obovate, the upper part livid, the lower whitish,

rounded or more commonly pointed at the apex, hairy on the back and fimbriate at the apex with a coarse white beard. Flowers about 1 line long. Outer perianth segments in the staminate flower free, abruptly acute, slightly longer and larger than the inner, spatulate, fuscous above and bearded. Pistillate flowers bearded similarly to the staminate, the lobes occasionally three; ovary shortly stipitate, dicoccous; stigmas two. The heads appear densely villous. This species is easily distinguished from *E. articulatum* and *E. compressum* by its villose receptacle, and from *E. decangulare* by its smaller stature, its more slender scape, shorter and acute bracts, smaller heads and flowers.

Texas, Drummond, 2nd coll., n. 409.

6. ERIOCAULON KÖRNICKIANUM, Van Heurck & Müll. Arg.

E. Körnickianum, Van Heurck et Müll. Arg. Obs. Pl. Nov. Herb. Van Heurck, 101 (1870).

I have not seen a specimen of this Texan plant, but the authors of the species describe it as having pellucid leaves which are five to seven-nerved, plane, smooth, 8 to 11 lines long and a little over 1 line wide at the base. Scapes numerous, 4 to 5 inches high, setaceous, smooth, compressed, two to three-angled, with lax sheaths which are as long as the leaves. Heads ovoid-globose, about 1½ inch long, a little longer than broad. Involucral scales fuliginous, broadly obovate, irregularly denticulate and white-woolly above, at length slightly recurved. Receptacle smooth. Bracts not quite 1 line high, surpassing the flowers. Sterile flowers about ½ line high; outer perianth segments smooth and black-glandular at the apex; inner obovate and pilose at the apex. Stamens four. Inner perianth segments of the fertile flower white-woolly on the margins. Style two-parted, plainly destitute of appendages. Seeds ellipsoidal, rough papillose.

East Texas. Coll. Charles Wright, in Herb. DC. et Van Heurck.

7. ERIOCAULON MICROCEPHALUM, H. B. K.

E. microcephalum, H. B. K. Nov. Gen. i. 253 (1815); Kunth Enum. 3, 548 (1841).

Small cæspitose plants. Leaves 4 to 8 lines long, acute, five to eight fenestrate-nerved, smooth above, often woolly at

the base. Scapes clustered, numerous, 4 to 6 lines high, smooth, four-angled, the angles often separated by finer intermediate striæ. Sheaths shorter than the leaves, rather obtuse at the point. Heads globular, about 1 line in diameter. Involucral scales broadly obovate, entire or denticulate, very light straw-colored, smooth or sometimes scantily fimbriate at the apex. Receptacle smooth. Bracts obovate, acute or obtuse, longer than the flowers, bearded at the apex. Flowers trimerous, a little more than 1 line high. Staminate flowers pedicellate; exterior perianth segments sometimes two only, obtuse, the posterior ones connate in a keeled hood and white pilose at the top; interior segments white, tubular below, three-lobed above, the lobes fimbriate, rounded, denticulate or entire at the apex. Stamens six. Fertile flowers sessile, exterior perianth segments often two only; fuscous above and pilose, the interior more delicate and longer, white, spatulate, obtuse, pilose internally and on the margin. Ovary sessile, three-celled. Style three-parted; stigmas three.

This species has found its way from Jalisco, Mexico, where it is common, to Fort Tejon, California, at which place it was collected by Xantus in the expedition of 1857–8, although it is not enumerated in Dr. Gray's list of Xantus' plants. I find specimens of it without a name in the Torrey Herbarium.

8. ERIOCAULON BENTHAMI, Kunth.

E. Benthami, Kunth. Enum. 3, 545 (1841), originally published by Bentham in his Pl. Hart., p. 28, as "*Eriocauli*, sp. nov?"

Leaves 1 to 3 inches long, smooth, about the same length as the sheaths or longer; eight to twelve-nerved, obtuse and callous at the apex. Scapes 4 to 15 inches high, smooth, six or seven-sulcate. Roots thick, nodose. Heads very white-woolly, globose, 2 to 3 lines in diameter. Involucral scales smooth, obtuse, somewhat longer than the bracts, straw-colored. Receptacle pilose. Bracts spatulate, fuscous, abruptly acute, woolly on the back and coarsely white-bearded on the apical margins. Flowers 1½ line high; perianth six-parted, the three exterior segments free, white below, fuscous above and bearded at the apex. In the staminate flower the interior perianth is stipitate

and the two anterior segments are connected with the posterior one; in the pistillate flower they are free. All the segments are bearded at the apex. Stamens six. Ovary stipitate, three-celled; style three-parted. The species is well distinguished from *E. decangulare*, to which it is similar in habit, by its six-parted flowers. Hartweg collected this plant at Lagos, Mexico.

Wet grounds, Province of Jalisco, Mexico, Palmer, 1886, No. 44, and Pringle, 1888, No. 1,734. June–November.

9. ERIOCAULON PRINGLEI, S. Wats.

E. Pringlei, S. Watson, Proc. Am. Ac. xxiii. 283 (1888).

A delicate plant with slender five to six-sulcate scapes ½ to 5 inches high, all the parts very smooth. Leaves acuminate, flat, about three-nerved, as long as or a little longer than the sheaths. Roots finely fibrous, spongy. Heads 1 to 1½ lines in diameter, fuscous. Involucral scales obovate, scarious, very dark, eroded at the apex. Receptacle smooth. Bracts pointed. Flowers scarcely ½ line high. Exterior perianth segments in both kinds of flowers two; the interior three. Sterile flower—outer segments free, pointed, entire; inner with a short tube or stipitate, eroded or denticulate at the apex. Stamens six. Fertile flower—outer segments the same; inner very narrow, shortly tubular at base. Ovary three or sometimes two-celled. Style three or sometimes two-parted.

Wet places at the base of Sierra Madre, Chihuahua, Mexico. Pringle, No. 2,018. October.

2. DUPATYA, Vell. Fl. Flum. 35, No. 42 (1825).

Pæpalanthus, Mart. Nov. Act. Nat. Cur. xvii. 1, 13 (1833-5).

This genus closely resembles *Eriocaulon* in general appearance and habit, but is distinguished by having the interior segments of the sterile flower campanulate-tubular, and the stamens of the same number as the lobes. The flowers are with rare exceptions three-parted throughout, the three stigmas often bifid. Seeds oval, more or less costate.

The genus is very extensively represented in South America, being concentrated in Brazil. Körnicke in his monograph enumerates 215 species. Only one is found in North America.

1. DUPATYA FLAVIDULA (Mx.).

Eriocaulon flavidulum, Mx. Fl. ii. 166 (1803).

Pæpalanthus flavidulus, Kunth, Enum. iii. 532 (1841).

Dupatya flavidula, Kuntze, Rev. Gen. Pl. 745 (1891).

Leaves 1 to 2 inches long, three to five-nerved, linear-subulate, floccose at base and smooth or sparingly pubescent above. Scapes numerous, five-sulcate, pubescent, 4 to 12 inches high. Sheaths longer than the leaves, obliquely fissured, slightly inflated at the summit, pubescent like the scape. Heads 2 to 3 lines in diameter. Involucral scales straw colored, scarious, smooth, shining, oval or ovate, obtuse, somewhat hairy at base. Receptacle pilose. Bracts very thin, white, linear, rounded or pointed at the apex, about as long as the flowers, slightly hairy, often obsolete. Flowers about 1 ¼ line high, trimerous, long pedicellate. Sterile flowers—outer perianth segments woolly at base, obovate or truncate and pilose at the apex. This encloses the inner part of the perianth consisting of a smooth, delicate, white; campanulate, somewhat three-toothed tube; stamens three, slightly exserted. Fertile flowers—outer perianth segments distinct, hairy at base, linear, acute, smooth, white, upper similar but much narrower, enclosing the ovary and connate over it nearly to the top. Style three-parted, forming three stigmas. Seeds sparingly and obscurely costate when mature. Roots spongy, scarcely nodose.

Körnicke (Linnæa, 27, 590) under the name *Eriocaulon flavidulum*, Mx., following Pursh (Fl. 1, 92) and Elliott (Bot. ii 566) states that two plants have been sent from North America under this name and that he regards Kunth's *P. flavidulus* as something distinct from the plant of Michaux. That which he describes is undoubtedly something distinct and is clearly an *Eriocaulon*, but, so far as I can judge, it corresponds very nearly, if not quite, to *E. articulatum*. The plant of Elliott is also, I think, that species. Michaux distinctly calls his species *puberulent* and the scapes *aggregated* and five-striate, while his other characters correspond very well with our plant. There is not, so far as ascertained, any other in the habitat given by him, "Carolina" that bears such characters.

Low sandy pine barrens, So. Va. to Florida. March–July.

3. LACHNOCAULON, Kunth, Enum. iii. 497 (1841).

Very similar to *Eriocaulon* in general appearance and habit, but distinguished by having the outer perianth only, the flowers always three-parted, three stamens which coalesce in a tube beneath, and one-celled anthers. The staminal tube appears to take the place of the sterile outer perianth segments of *Eriocaulon* and *Pæpalanthus*, and the place of the inner segment of the fertile flower is occupied in this genus by a loose mass of hairs, or sometimes by three rows of hairs. Style club-shaped, dividing into three bifid stigmas which alternate with three appendices.

The genus is confined to the Southern United States, in which four species occur.

1. LACHNOCAULON ANCEPS (Walt)

Eriocaulon anceps, Walt. Fl. Car. 83 (1788).

E. villosum, Mx. Fl. ii. 166, (1803) Pursh, Fl. i. 92, (1814).

L. Michauxii, Kunth, Enum. iii. 497, (1841) Chap. Fl. 504, (1860).

Leaves 1 to 3 inches long, tapering to an obtuse callous point, smooth or sparingly hairy, seven to twelve-nerved or often apparently nerveless. Scapes slender, 2 to 20 inches high, two to four-ribbed, the ribs themselves often with intermediate striæ, clothed with long, soft, appessed, upwardly-pointed hairs. Sheaths as long as or shorter than the leaves, hairy like the scape, and pointed like the leaves. Heads globose, 1 to 3 inches in diameter. Involucral scales ovate or oblong, obtuse or pointed, smooth or hairy, shorter than the flowers, usually fuliginous. Flowers about 1 line high, bracts fuliginous, spatulate, often keeled, surrounded at base by the yellowish, silky hairs of the villose receptacle and white bearded at the apex. Perianth segments in the sterile flower on a short stipe which is hairy at the base, spatulate, fuliginous and fimbriate at the apex. Those of the fertile flower white, smooth, oblong, obtuse; ovary sessile, densely villous around the base; style three-divided; stigmas bifid, seeds strongly costate. Roots finely fibrous. The white segments of the fertile perianth mingled with the fuliginous woolly segments of the sterile flowers impart a mixed gray and dark appearance to the heads.

Low pine barrens, So. Va. to Florida. March–June.

2. LACHNOCAULON GLABRUM, Körn.

L. glabrum, Körn. Linnæa, xxvii. 568, (1854), Chap. Fl. 504, (1860).

Leaves ½ to ¾ inch long, flat, acuminate, blunt and callous at the tips, about as long as the sheaths, smooth or with a few scattered hairs at the margins. Scapes numerous, smooth, 3 to 4 inches high, and three to five-angled. Heads very dark and nearly smooth externally, at first globose, becoming cylindrical or slightly conical and 3 lines long, looking, as Chapman observes, not unlike those of *Eleocharis ovata*. Involucral scales fuscous, lighter in color than the bracts and flowers, ovate, acute, smooth or pubescent. Receptacle villous with clavate hairs. Bracts very dark, pubescent, carinate on the back and cucullate at the apex, enclosing the flowers. Flowers scarcely ½ inch high, much smaller than those of No. 1. Segments woolly at base, the anterior much like the bract and partially enclosing the others. The peculiar dark, matted, and smoothish appearance of the heads in this species is owing to the cucullate bracts and flowers which are closely packed together.

Roots finely fibrous, not nodose. Ovary three-celled, styles divided into three stigmas. Körnicke makes the stigmas bifid, but in all the specimens that I have examined they are entire. Seeds strongly costate.

Sandy shores of the Gulf of Mexico, Florida. (Chapman). Oct.

3. LACHNOCAULON BEYRICHIANUM, Sperdeler.

L. Beyrichianum, Sperdeler in Körn. Linnæa, xxvii. 567, (1854).

Leaves bright green, 1 to 1½ inch long, tapering to a sharp point, obscurely nerved, often woolly at base, scantily hairy above, somewhat longer than the sheaths. Scapes numerous, 1 to 3 inches high, three to five-striate, sparsely hairy, the hairs like those of No. 1. Heads globose or cylindrical and slightly longer than broad, 1 to 1½ lines long, grayish-villose, the hairs very apparent. Involucral scales oblong, obtuse, hairy or becoming glabrate, fuscous. Bracts spatulate, somewhat larger than the flowers, smooth or grayish pubescent above. Segments of perianth much the same. Flowers scarcely half a

line high. Receptacle hairy as in No. 2. Styles divided into three simple stigmas.

Körnicke attributes this species to Ebenezer, a place in middle Georgia, collected there in July by Beyrich. It was distributed as *L. glabrum* by Curtiss, No. 3,022, collected by him on "Sandy shores, Walton County, N. W. Florida." September.

Bentham and Hooker (Gen. Pl. iii. part 2, p. 1,024) regard Körnicke's plants as well developed specimens of *L. anceps*, but the species is quite distinct both from *L. anceps* and *L. glabrum*. From the former it is distinguished by its much smaller size, numerous scapes, smaller and more elongated heads, obtuse involucral scales, far smaller flowers and simple stigmas; from the latter by its hairy scapes, grayish-villose, nearly globose and far smaller heads.

4. LACHNOCAULON DIGYNUM, Körn.

L. digynum, Körn. Linnæa, xxvii. 570, (1854).

I have not seen specimens of this. Körnicke attributes it to Alabama, from whence it was sent by Bentham, and describes it as having a leafy epigean stem ½ to 1½ inch in length. Leaves smooth, nervose-striate, flat, bright green, 4 to 7 lines long. Scapes smooth, 3 to 5 inches high. Sheaths obliquely fissured, sparsely pilose, a little longer than the leaves. Heads semi-globose, 1 line in diameter, grayish-villose. Involucral scales oblong, acute, ciliate at the apex and villous on the back, at length glabrescent, fuscous. Bracts spatulate, carinate. Receptacle pilose. Flowers pedicellate; segments of the perianth connate toward the base, spatulate, rounded and hairy at the apex. Stamens three, anthers oblong, white; the triple segments of the rudimentary pistil in the sterile flower papillose. Fertile flowers sessile, segments of the perianth free, obovate, narrowed at the base, pilose at the top of the back. It differs, according to Körnicke, from all the preceding species in having a two-celled ovary, two appendices, a two-parted style and bifid stigmas.

It is regarded by Benth. and Hook. l. c. as probably a depauperate form of *L. anceps*, with heads not yet well developed, but it appears to me to come much nearer to *L. Beyrichianum*. Fresh specimens are very desirable.

New or Noteworthy North American Phanerograms.—V.

By N. L. Britton.

Thalictrum dioicum, L. var. CORIACEUM n. var. Segments of the decompound leaves firm, pale beneath, rather dark green above, reniform-orbicular and broader than long, or obovate, deeply and sharply incised, the lobes rounded. "Plant always dicœcious, staminate flowers white, pistillate purple."

At elevations above 3,000 feet, on Blowing Rock, Table Rock and Stone Mountain, North Carolina. Collected by J. K. Small and A. A. Heller, 1891, and by Professor Porter in the same region many years before.

Ranunculus delphinifolius, Torr. in Eaton, Man. Ed. 2, 395 (1818) and subsequent editions; not H.B.K. Nov. Gen. v. 48 (1821).

R. multifidus, Pursh, Fl. Am. Sept. 736 (1814) not Forskall (1775).

R. fluviatilis, Bigel. Fl. Bost. 139 (1814) not of Willd.

R. Purshii, Hook. Fl. Bor. Am. i. 15 (1830) in part.

R. lacustris, Beck & Tracy, in Eaton, Man. Ed. 3, 395 (1822).

The name of this plant has had a very curious history, which I am now prepared to trace, having seen authentic specimens of all the above-cited descriptions. First characterized by Pursh, who gave it a name already belonging to an Egyptian or Arabian plant, it was next alluded to by Dr. Torrey, under the name *R. delphinifolius*. Pursh's type was collected by Bradbury in "Upper Louisiana," and is preserved in the Herbarium of the Academy of Natural Sciences of Philadelphia. Torrey's plant was from New York, and a specimen bearing the label in his own handwriting is contained in the Kew Herbarium, "*R. delphinifolius*, Torr. in Eat. Man. Ed. 2." In his catalogue of plants within thirty miles of New York (1819), Torrey adopted Bigelow's name *R. fluviatilis* for the species; in his Compendium he took *R. multifidus*, and in the Flora of North America and Flora of New York he called it *R. Purshii*, never returning to his original name for it. I have been unable to ascertain his reason for this course. Perhaps, he thought this was preoccupied by the

homonym of Humboldt, Bonpland and Kunth, which was published, however, three years later.

In his discussion of this plant in Pittonia, ii. 62, Professor Greene adopts the name of Beck and Tracy and I have followed him in alluding to it, but the Kew specimen from Dr. Torrey and a glance at the second edition of Eaton's Manual are conclusive proof that we have been wrong.

The arctic and Rocky Mountain plant, *R. Purshii*, Richards, Frank. Journ, 741 (1823); *R limosus*, Nutt., *R. multifidus*, var. *repens*, S. Wats., appears to me to be specifically distinct. It is a creeping, pubescent, uliginous species with smaller flowers and smaller achenes which have an acutish back, and the style is slender; *R. delphinifolius* is normally strictly aquatic, glabrous, its achenes have a thickened, almost winged margin, and the style is flat and broadened at the base. It develops broader leaf-segments when the water in which it habitually grows becomes low and the plants thus become emersed.

It should be added that a specimen from Dr. Torrey, labelled *R. lacustris*, Beck and Tracy, is preserved in the Philadelphia Herbarium, and is the same species as *R. multifidus*, Pursh, which may be further proven by the figure of *R. lacustris* published by Beck and Tracy in Trans. Albany Inst. i. plate V. I have not access to a copy of the first edition of Eaton's Manual.

Ranunculus trichophyllus, Chaix, in Vill. Hist. Pl. Dauph. i. 335 (1786).

R. aquatilis, var. *trichophyllus*, A. Gray, Man. Ed. 5, 40 (1867).

I think this should rank as a species rather than a variety of *R. aquatilis*, L., which only exists in America, as far as known, in the far northwest, where it is represented by the var. *heterophyllus*, as pointed out by Dr. Gray.

Hypericum mutilum, L. Sp. Pl. 787 (1753).

Ascyrum Crux-Andreæ, L. loc. cit.

While it may, perhaps, be ascribed to a blunder in the make-up of the first edition of the "Species Plantarum," there is no doubt whatever that Linnæus described the same plant as two

species in different genera on the same page. This has been indicated by Torrey and Gray, (Fl. N. A. i. 672). The specimen described by Plukenet (Mant. 104), as "Hypericoides ex terra Mariana floribus exiguis luteus" on which Linnæus based his *A. Crux-Andreæ*, is preserved in the Sloane Herbarium, (vol. 92, p. 85), at the British Museum of Natural History, and is *Hypericum mutilum*, while the specimens of Gronovius, on which he based *H. mutilum*, are in the general herbarium of the same institution. The plant taken up by Torrey and Gray for *A. Crux-Andreæ* is *A. hypericoides*, L. Sp. Pl. 788, as evidenced by the Gronovian specimen on which it is based, fortunately also preserved.

President Coulter, in his paper on the North American Hypericaceæ (Bot. Gaz., 1886, 80), has maintained that we have two closely related species of *Ascyrum*, associating specimens from the southern states with the tropical American plant which Linnæus took up for his *A. hypericoides* in the second edition of his Species Plantarum (p. 1108), basing it on specimens sent him by P. Browne from Jamaica, one of which is preserved in his herbarium. However, whether we have one species or two, the northern plant is the original *A. hypericoides*, and should bear that name. All the specimens in the Columbia College Herbarium, including many from Florida, are readily referable to it, and different from the West Indian and Central American species.

Hypericum Canadense, L., var. *minimum*, Choisy in DC. Prodr. i. 550.

The type of this is preserved in the "Prodromus Herbarium" at Geneva. It is a fragment of a three-styled species with narrow leaves, not satisfactorily referable to *H. Canadense*, though it may as well be that as anything else, and its origin is unknown. From Choisy's remarks at the place of publication, he apparently thought it was Mexican. In any event it is not at all the Northern plant with oval or orbicular lower leaves which has been refered to it, and which may be called *H. Canadense*, var. BOREALE.

Potentilla Canadensis, L. Sp. Pl. 498 (1753).

Potentilla simplex, Michx. Fl. Bor. Am. i. 303 (1803).

P. Canadense, var. *simplex*, T. and G. Fl. N. A. i. 443 (1840).

From the very great difference in appearance of the extreme forms of this plant, I had about come to the conclusion that *P. simplex*, the large, ascending or erect condition, was actually specifically distinct from the smaller one with prostrate branches. But a study of the plant during the past spring in the vicinity of New York has convinced me that *simplex* cannot be separated even as a variety, for I found them growing from the same clump. In shaded woodlands the *simplex* condition prevails, while the other prefers open places, and reaches its extreme degree of depression (var. *pumilio*, T. and G.) in very dry, sterile soil. There is, therefore, no more reason for maintaining varieties in it than in the case of *Erigeron Canadense*, which varies from an inch in height to ten feet or more. The type of *P. Canadense*, L. is preserved in the Linnæan Herbarium, and that of *P. simplex*, Michx. in the herbarium of Michaux at Paris, and so far as they go, are correctly understood.

RUBUS MILLSPAUGHI, n. sp.

Ascending, wand-like, entirely unarmed or with a very few, weak prickles above, glabrous throughout or the younger shoots scurfy-pubescent. Stems 1½-4 meters long; leaves long-petioled, pedately five-foliolate or some of those on the twigs three-foliolate; leaflets thin, oval, glabrous on both sides, long-acuminate at the apex, mostly rounded at the base, 12-15 cm. long, about 5 cm. wide, sharply but not deeply serrate; stalk of the terminal leaflet 7-10 cm. long; inflorescence loosely racemose; bracts linear-lanceolate; pedicels slender, ascending; sepals lanceolate, acuminate; fruit black, about 10 mm. long.

In rich woods, Point Mt., West Virginia, at 3,500 ft. altitude (C. F. Millspaugh). Nearest to *R. villosus*, but evidently a distinct species. Curiously enough there is a leaf of this plant glued down on the sheet of *R. Canadensis*, L. in Herb. Linn., and it appears to have been included in his description of that species—the specimens furnished by Kalm.

Agrimonia striata, Michx. Fl. Bor. Am. i. 287 (1803).

A. Eupatoria of most American authors, not of L.

A. Eupatoria, var. *parviflora*, Hook. i. 196 (1832).

The American plant has certainly been erroneously referred to the European *A. Eupatoria*, which is very distinct from it, by its larger flowers and fruit, denser inflorescence, much greater

amount of pubescence and different foliage. The genus *Agrimonia* was monographed by Wallroth in his "Beiträge zur Botanik," i. 1-61 (1842), and a much larger number of species recognized than have since been admitted. There is at least one of his North American species there first described, which seems to me perfectly good; this is:

Agrimonia microcarpa, Wallr. Beitr. i. 33, 39, t. 1. f. 3. (1842).

Smaller and more slender than *A. striata*, villous-pubescent at least below. Larger leaflets 3-5, obovate, obtuse or sometimes acutish at the apex, narrowed or cuneate at the base, dentate, 1½-5 cm. long, glabrous or nearly so above, generally pubescent along the veins beneath; raceme very slender, the flowers short-pedicelled, less than two lines broad; petals slightly exceeding the calyx-lobes; fruit smaller, about 3 mm. long.

In dry soil, Pennsylvania (according to Wallroth), Maryland (Rusby), to Florida (Chapman), west to Kentucky (Short) and Louisiana (Carpenter).

MAMILLARIA NOTESTEINII, n. sp.

Stems oval, simple or cæspitose, about 3 cm. in diameter. Tubercles nearly terete and about 6 mm. high; spines 12-18, white, becoming gray with age, weak and slender, 8-12 mm. long, spreading, pubescent throughout. Usually each tubercle bears a central spine which is longer and stouter than the others, and is frequently tipped with pink; flowers 15-25 mm. in diameter, ash-gray, tinged and penciled with a delicate pink. Petals broadly linear-oblong, mucronate tipped; fruit obovoid; seeds black, globose, pitted.

Found in gravelly soil, near a small creek, in the vicinity of Deer Lodge, Montana, by Prof. F. N. Notestein, June 4th, 1891.

OXYPOLIS, Raf. Neogen. 2 (1825).

Tiedemannia, DC. Mem. Omb. 51, t. 12 (1829).

Archemora, DC. loc. cit. 52 (1829).

Rafinesque characterizes the genus and cites *Sium rigidius*, L. as the type, so there can be no question about what he had in mind. This plant is well known to be *Archemora rigida*, DC., and *Tiedemannia rigida*, Coult. and Rose.

PTILIMINUM, Raf. Neogen. 2 (1825).

Discopleura, DC., Mem. Omb. 38 (1829).

Rafinesque also characterizes this genus and gives *Ammi capillaceum*, Michx., as the type. This is *Discopleura capillacea*, DC.

SPERMOLEPIS, Raf. Neogen. 2 (1825), not Brong. & Gris.

Leptocaulis, DC. Mem. Omb. (1829).

This genus is based on *Daucus divaricatus*, Walt., which is *Sison pusillum*, Michx., *Leptocaulis divaricatus*, DC., and *Apium divaricatum*, Wood. If this species and its allies are to be kept distinct from *Apium*, L. as has been done by Coulter and Rose, it should be under Rafinesque's generic name.

ADORIUM, Raf. Neogen. 3 (1825).

Marathrum, Raf. Journ. Phys. lxxxix. 101 (1819), not Humb. and Bonpl.

Musenium, Nutt. in T. and G. Fl. N. A., i. 642 (1840).

Perceiving that the generic name *Marathrum* was already used, Rafinesque substituted for it *Adorium*, eleven years before Nuttall named *Musenium*. The names of Rafinesque and Nuttall are both based on *Sescli divaricatum*, Pursh.

Solidago juncea, Ait. var. RAMOSA, Porter and Britton, n. var.

Differs from the typical plant in the numerous, strict, erect branches, the racemes numerous, slender, erect or slightly recurved at the ends.

In fields, western New Jersey and eastern Pennsylvania (Porter), Ohio (Sullivant), and West Virginia (Millspaugh). Strikingly different in appearance from *S. juncea*. Professor Porter informs me that he sent specimens of the plant to Dr. Gray, after the volume of the Synoptical Flora containing the Compositæ was issued, and was told that he had not seen it before.

Cyperus Houghtoni, Torr. Ann. Lyc. N. Y. iii. 277 (1836).

This species was described by Dr. Torrey from a specimen collected by Dr. D. Houghton at the Lake of the Isles, Northwest Territory, in August, 1831, (No. 73), and the type of it is preserved in the Columbia College Herbarium. He subsequently concluded that it was not distinct from his *C. Schweinitzii*, as is indicated in pencil in his copy of the Monograph of North American Cyperaceæ, and in his copy of Steudel's Cyperaceæ. In his herbarium the types of both species are mounted on the

same sheet. I passed the plant over in my Preliminary List of North American Species of Cyperus, (BULLETIN, xiii. 205-216), having only the original specimen to go by, and accepting Dr. Torrey's later view. But recently I have had numerous specimens from the Northwest and other regions, which maintain the characters of the original, and satisfactorily establish the species as a good one.

My attention has been especially called to it by Mr. John M. Holzinger, Assistant Botanist to the U. S. Department of Agriculture, who last year sent me abundant specimens collected by Dr. E. A. Mearns, U. S. A., at Camp Douglas, Wisconsin. I did not then recognize in these Torrey's species, and was disposed to regard the plant as undescribed. Mr. Holzinger has again sent me more and very fine specimens of Dr. Mearns' collection of 1891, and thus by impressing on me the characters of the plant, caused me to make a careful examination of the group to which it belongs.

The species is nearest *C. Schweinitzii*, but readily distinguishable from that plant by its globose, dense heads, smooth culms, shorter and broader truncate or apiculate scales, and shorter nut. I have it now from the following localities: Lake of the Isles, N. W. Terr., (Houghton No. 73); Camp Douglass, Wisc., (Mearns No. 28); St. Croix River, Minn., (Holzinger); Cheboygan Co., Mich., (C. F. Wheeler); Wichita, Kans., (Carleton); Columbia River, Sand Island, Oregon, (Thos. Howell); Kuskuski River, (Wilkes Exp.); Wareham, Mass., (Ex. Herb. L. H. Bailey); Lake George, N. Y., (Wm. H. Leggett). It thus ranges all across the continent. I referred the Oregon specimens collected by Geyer, which I saw in Herb. Gray to this species in my Preliminary List, but was uncertain about them. They probably belong here.

The plant which I described in my Preliminary List (p. 208) as *C. Schweinitzii*, var. *debilis*, which extends from Colorado (Redfield) to Chihuahua, is most likely another distinct species.

Rynchospora scutellata, Griesb. Cat. Pl. Cub. 246 (1866).

This species, founded on Charles Wright's No. 3406 from Western Cuba, was collected by the late Mr. H. W. Ravenel on damp prairies near Indianola, Texas, May 3d, 1869, (No. 160),

and distributed under the manuscript name *Ceratoschœnus brevirostris*, n. sp. I am indebted to Mr. C. B. Clarke for the determination. The following description may serve for its identification: Stem erect, rather stout, 3-9 dm. high, glabrous. Leaves linear, flat, the lower 3-4 dm. long, 6-8 mm. wide, slightly roughened on the margins, those of the stem distant, shorter; spikelets lanceolate 6-10 mm. long, three to five-flowered in corymbose clusters, the rays slender, unequal, 2½-5 cm. long; clusters composed of three to five spikelets; glumes brown, ovate, acute, mucronate, the fertile ones larger than the sterile; nut brown, ovate or obovate, compressed, slightly concave on each face, 3-4 mm. long, finely puncticulate, with a rather prominent keel on both edges; beak black, compressed, conic, about as long as the nut, slightly papillose, bristles slender, unequal, the larger equaling or slightly exceeding the nut, finely barbed upwardly.

The Texan specimen differs from the Cuban only in its larger and denser clusters and somewhat narrower nut. The species comes next to *R. corniculata*, (Lam.)

STENOPHYLLUS, Raf. Neogen. 4 (1825).

This proposed genus of Rafinesque is briefly characterized by him and *Scirpus stenophyllus*, Ell. named as the type. This plant is the same as *Dichroma cæspitosa*, Muhl., and was transferred to *Isolepis* by Dr. Torrey in his monograph of the North American Cyperaceæ (Ann. Lyc. N. Y. iii. 353, 1836). In 1837 Kunth (Enum. ii. 209) independently referred it to *Isolepis*, but under a section which he proposed should form a genus under the name *Bulbostylis*, although he did not name the species under that genus. I allude to Rafinesque's genus here because Mr. C. B. Clarke has sent me specimens of the Indian *Isolepis barbata*, a very closely allied species under the name *Bulbostylis barbata*, and informe me that he has adopted Kunth's genus as distinct from *Fimbristylis* and *Scirpus* in his forthcoming monograph of the Cyperaceæ. Rafinesque's generic name has twelve years priority over Kunth's. Our *Fimbristylis capillaris* (L.) and a number of tropical American species are congeners. The genus is especially distinguished by the thickened, persistent base of the style, and most of its species have ciliate leaves.

Notes on Three New or Noteworthy Diseases of Plants.

By F. D. Chester.

During the work of the past summer my attention has been called to three diseases of cultivated plants, caused by fungi, which are apparently new.

A brief description of them will be given here, while a fuller account, with figures, will be reserved for one of the regular publications of the Experiment Station.

Anthracnose of the Tomato.

This disease appeared during the past summer upon the grounds of the Experiment Station, where it has caused a considerable destruction of fruit.

So far as observed it does not affect the green tomato, but rather at the point when it just begins to color, and from that on to complete ripening. When, however, an attack is once made, the malady spreads so rapidly as to occasion serious loss before the fruit can be gathered.

The disease shows itself upon the tomato as sunken, discolored spots, each with a dark center, becoming black. These spots increase in size, or by confluence cover a large portion of the decaying fruit. Over this area the fruit is black and shrunken, flattened or depressed, surrounded by a shrunken, corrugated, discolored skin; the dark centers due to the gregarious acervuli with their dark setæ.

The disease is easily and quickly produced by introducing the spores within a puncture made by a sterilized needle, but no results have yet come from repeated attempts to produce the disease by sowing the spores upon the uninjured surface of either ripe or green tomatoes. The fungus causing the trouble is a species of *Colletotrichum*. It is clearly distinct from *C. nigrum* E. & Hal., found by Dr. B. D. Halsted on cultivated peppers, which, however, it somewhat resembles. Attempts to grow the tomato fungus on peppers, even by introducing the spores of the latter beneath the skin, were unsuccessful.

The following botanical description of the fungus is appended:

Colletotrichum Lycopersici, n. sp.

Spots depressed, circular, slightly discolored, center black, 5–10 μ in diameter, afterwards becoming irregular and confluent. Acervuli abundant, densely gregarious, rusty brown to black, applanate, 95–150 mm. in diameter. Setæ abundant, fulignous, generally curved, rarely undulate or straight, often geniculate in places, gradually tapering, septate, length 65–112 μ, about 5 μ at base. Spores oblong 16–22$\mu\times$4, average 18–20$\times$4, ends subacute, hyaline, generally containing two to three oil drops which stain brown with osmic acid. Basidia short, slender, 30–40 μ, arising from a well-developed stroma. On fruit of cultivated tomato.

A Leaf Spot of Celery.

Not long since some celery leaves were brought into my laboratory by a local gardener with the complaint that his celery plants were suffering badly. To general appearance the affection seemed to be the ordinary leaf blight, (*Cercospora Apii*, Fres.), but closer observation showed the spots to be covered with numerous black pustules, which upon further examination proved to be the pycnidia of a *Septoria*.

Examinations were at once made in other celery gardens, and in all the same disease was found. The effect upon the plant is very similar to that of the well known leaf blight, causing in extreme cases a complete wilting of the leaves, and in the case of younger growths a complete destruction of the entire plant.

The spores, which germinate readily in water, were sown upon healthy leaves with the result that in fifteen days the characteristic spots were produced at the points of infection, upon which were developed pycnidia containing the spores of this fnngus. The fungus of the disease is apparently distinct from *Septoria Pastinacæ*, West, and from *S. pastinacina*, Sacc., both found on *Pastinaca sativa*, L.; the former species having larger and septate spores, while the *Septoria* on celery is to all appearance non-septate. The latter species differs in having much smaller spores (20–30$\mu\times$7–1 μ) and larger pycnidia (120–150 μ).

The fungus, according to the opinion of Mr. J. B. Ellis, is more closely related to *Septoria Petroselini*, Desm., but is probably not identical with it.

Through Dr. D. H. Halsted I am informed that Briosi has named a variety of the last species, i. e. *S. Petroselini*, var. *Apii*,

which may be the form in question, but in the absence of specimens, the writer has no way of proving the point.

Whether the form in question is a new species, in which case it might be named *Septoria Apii*, or simply the above variety, is unimportant. The fact remains that the presence of this disease is noteworthy and it is therefore brought to the attention of mycologists.

The fungus is described as follows:

Spots amphigenous, white to tawny, irregular, becoming confluent, the entire leaf finally wilting. Pycnidia black, innate, scarcely erumpent, amphigenous, 74-100 μ in diameter, mostly 90μ, globose-subglobose, loosely gregarious. Sporules hyaline, curved-flexuose, 25-40 μ × 2-2.5 μ, apparently non-septate or septulate, eguttulate, one end commonly attenuate.

On leaves of cultivated celery.

Blight of Watermelon Vines.

For some years past growers of watermelons in the southern part of Delaware have suffered badly from a disease which seems heretofore to have escaped the notice of mycologists.

During the present season a noted grower in this section experienced almost a complete failure of his crop through the same trouble. The malady was not brought to my notice until rather late in the season, and hence it was difficult to make the extended field observations which would be advisable.

Present observations have demonstrated, however, that the trouble is due to a parasitic fungus, most destructive in its habit, and capable of widespread financial disaster wherever it gains foothold. Young plants, 10 feet or less in length, attacked by the fungus, generally go down completely, while older plants suffer through the more or less complete destruction of their foliage and other tender parts of the vine, preventing completely the further development of the melon. Nor do the young fruit, up to the size of marbles, and fruit buds escape, such parts turning black, and finally developing the mature pycnidia of the fungus.

In short, the disease attacks leaf, leaf stalk, stem, tendrils, fruit buds and blossoms. It shows itself upon the leaves as black, circular or irregular spots, marked by concentric ridges. These spots increase in size and coalesce so as to cover a large

part or all of the leaf. On leaf stalks and tendrils as elongated dark lines, which increase in breadth so as to involve the part and cause it to turn black and shrivel. Similar elongated spots, which afterwards become white in the center, mark its stems, but in the case of these woody growths, the damage I have not found sufficient in the specimens examined to be serious, the injury being mostly confined to the tenderer parts of the vine.

The spores of the fungus, which germinated readily, were sown upon a young watermelon plant, grown from seed in the greenhouse; in three days the plant thus affected began to show signs of disease; in eighteen days the plant was completely dead. An examination of the blackened and wilted leaves showed the pycnidia of the fungus containing the characteristic and well developed sporules.

The check plant uninfected remained healthy, with no signs of the disease.

The fungus causing the above trouble is a member of the genus *Phyllosticta*, although from the character of the sporules, which are sometimes uniseptate and hyaline, it is questionable whether it might not, following Saccardo, be classed as an *Ascochyta*. It seems to differ from either *P. orbicularis*, E. and E., or *P. curbitracearum*, Sacc., found on *Cucurbita Pepo*, L., and is here described as new.

Phyllosticta Citrullina, n. sp.

Spots circulur, irregular, black, concentrically ridged, becoming confluent. Pycnidia amphigenous, brown, immersed, scarcely erumpent, membranaceous, lenticular 75-131 μ, average of many measurements 107 μ × 67 μ. Sporules 9-10.7 μ, average about 10 μ × 3.5 μ generally continuous, sometimes uniseptate, straight, slightly curved, ends obtuse, often biguttulate, hyaline.

On leaves and other parts of watermelon.

Delaware College, Newark, Del., Oct. 27, 1891.

Botanical Notes.

An extraordinary case of fasciation has just been brought me in a specimen of *Rudbeckia hirta* from Warwick, R. I. The plant is about eighteen inches high; the flattened stem, covered with numerous, well-formed leaves, is at its narrowest part over

an inch in width, and only very gradually tapers to the *capitula*. The number of these which have consolidated it is quite impossible to determine. The resultant mass, allowing for curvature, must be all of five inches across. One lateral branch of two heads is separated from the main stem. A cross section of the stem exhibits a sort of watch-glass form, or it may be better compared to a dumb-bell. The very long petioles of the leaves is a noticeable feature. The disk is marked through much of its length by a longitudinal fissure. W. WHITMAN BAILEY.

Providence, R. I., June 30th, 1891.

Lespedeza striata. As supplementary to Dr. Porter's note in the October BULLETIN, I would say that I found it here in 1889, along a road. When first noticed it was a very small patch; this summer I found it along that same road for nearly a mile. It appears to be well pleased with our climate and will stay. As far as it has spread it stands very thick on the ground, completely covering it. JACOB SCHNECK.

Mt. Carmel, Ill.

Preliminary Check-List of the Flora of Crawford County, Pa. Mr. C. C. Mellor, of Pittsburgh, has obligingly sent me a copy of a 12-page pamphlet with the above title. It bears neither date, name of the author, nor place of publication. The pages are not numbered. The list gives the species arranged alphabetically, and their common names, but no definite localities. It is not included in my list of State and Local Floras published in Vol. 5, Annals New York Academy of Sciences.

N. L. BRITTON.

Plantæ Cultivatæ Exsiccatæ. (West Am. Sci. vii. 273, 274.) The Orcutt Seed and Plant Co. of San Diego, Calif., announce the commencement of a series of fascicles representing cultivated plants grown at San Diego. Fleshy parts of plants will be preserved in alcohol if desired, and sections of ligneous plants made upon request. The price of the first century, unmounted, has been placed at $10.00.

Index to Recent Literature Relating to American Botany.

A Letter from Dr. Geo. Engelmann to Dr. C. C. Parry. (West Am. Sci. vii. 271).

Anatomical Characters of North American Gramineæ.—A Study of Some. Theo. Holm. (Bot. Gaz. xvi., 166-171, 219-225, 275-281, 5 plates).

An anatomical study of species of *Uniola, Distichlis*, and *Pleuropogon.*

A Remarkable Orange Tree. W. W. Bailey. (Bot. Gaz. xvi. 311, 311).

The author cites an instance in which an orange tree, completely girdled, lived and bore fruit for at least seven years, although there was no connection between the upper part of the tree and its roots except through the heart wood. The tree finally yielded when a vigorous young sprout came up from the root.

Aristolochia gigas. W. B. Hemsley. (Gard. Chron. x. 552, f. 75).

Bacteria of the Melons. Byron D. Halsted. (Bot. Gaz. xvi., 303-305).

Read before Sec. F., A. A. A. S., Washington meeting, Aug., 1891.

Botanical Jottings. A. Alexander. (Journ. and Proc. Hamilton Asso., Part vii., 79-85).

Cleistogamy in Polygonum acre. T. H. Kearney, Jr. (Bot. Gaz., xvi. 314, illustrated).

Epiphyllum Gærtneri. (Bot. Mag. t. 7201).

Flora of St. Helen's Island, Montreal—Notes on the. D. P. Penhallow. (Can. Rec. Sci. iv. 369-372).

A list of some sixty native and introduced plants.

Further Notes on the Mutilation of Flowers by Insects. J. Schneck. (Bot. Gaz. xvi. 312, 313).

The author adds that he has seen *Xylocopa Virginica* visit *Pentstemon pubescens, P. lævigatus, Pontederia cordata, Astragalus Canadensis* and *Trifolium pratense.*

Helianthus mollis. Thos. Meehan. (Bot. Gaz. xvi. 312).

A note on variation according to environment.

Ilex Cassine, the Aboriginal North American Tea. E. M. Hale. (Bull. No. 14, Div. Bot. U. S. Dept. Agric., illustrated).

This is an account of *Ilex vomitoria*, Ait., with figure of the species in fruit and a map of the United States showing distribu-

tion. The history of its use by the North American Indians as a beverage—the so-called "black drink"—is fully described, and copious references are given to early explorers who have written in regard to it.

Ipomœa pandurata. Geo. H. Shull. (Am. Gard. xii. 637, 638, illustrated).

Both *Ipomœa pandurata* and *Calystegia sepium* are figured, and the warning is given that they have been introduced by unscrupulous dealers as "grand novelties."

List of the Plants of Arkansas. John C. Branner and F. V. Coville. (Ann. Rep. Geol. Surv. Ark. Vol. iv. 155-242.)

This is a catalogue of plants of the state, giving localities for the rarer or more interesting species, and prefaced by an account of the sources from which the information used in its preparation has been derived, including remarks on the bibliography and explorations. Mr. Coville spent several months of the summer of 1888 about Little Rock and in Independence Co., and thus became familiar with the general features of the flora. The system of nomenclature adopted is that of the "oldest specific or varietal names under whatever genera they may originally have been employed. On this principle, Prof. William Trelease, Director of the Missouri Botanical Gardens at St. Louis, has kindly revised the list." We note the following binomials here used for the first time: *Castalia reniformis* (DC.) for *C. tuberosa* (Paine) Greene; *Arabis Virginica* (L.), for *A. Ludoviciana*, Meyer; *Hosackia sericea* (Pursh.) for *H. Purshiana*, Benth.; *Neptunia virgata* (Bartr.) for *N. lutea*, Benth.; *Schrankia Intsia* (Walt.), for *S. uncinata*, Willd.; *Desmanthus Cooleyi* (Eaton) for *D. Jamesii*, T. and G.; *Acacia filicoides* (Cav.), for *A. filicina*, Willd.; *Vernonia gigantea* (Walt.), for *V. altissima*, Nutt.; *Vernonia geraniæfolia* (Walt.), for *V. angustifolia*, Michx.; *Vernonia marginata*, (Torr.), for *V. Jamesii*, T. and G.; *Aphanostephus skirrobasis* (DC.), for *A. Arkansana*, Nutt.; *Berlandiera pumila* (Michx.) for *B. tomentosa*, Nutt.; *Marshallia trinervia* (Walt.) for *M. latifolia*, Pursh.; *Polypteris sphacelata* (Nutt.) for *P. Hookeriana*, Gray; *Sabbatia dichotoma* (Walt.) for *S. calycosa*, Pursh.; *Phacelia dubia* (L.), for *P. parviflora*, Pursh.; *Herpestis acuminata* (Walt.) for *H. nigrescens*, Benth.; *Dianthera ovata* (Walt.) for *D. humilis*, (Engelm

and Gray); *Calamintha glabra* (Nutt.) for *C. Nuttallii*, Benth.; *Schedonardus paniculatus* (Nutt.) for *S. Texanus*, Steud.; *Eragrostis interrupta* (Nutt.) for *E. oxylepis*, Torr.

The work is a valuable contribution to geographical botany, and cannot fail to give an impetus to the study of plants in the great area which it covers. N. L. B.

Mutilation of the Flower of Tecoma radicans. J. Schneck. (Bot. Gaz. xvi. 314, 315).

A note to the effect that *Icterus Baltimore* is responsible for the mutilation of flowers of this plant while in search of nectar.

Native Trees and Shrubs of Nebraska—A Preliminary Report on The. C. E. Bessey. (Bull. Agric. Exp. Sta. Neb. iv. Art. No. 4).

A list of sixty-one trees and sixty-four shrubs, with notes on habit, general appearance and distribution, both geographic and with reference to elevation.

Notes on California Plants.—I. S. B. Parish. (Zoë, ii. 116, 117).

An account of the manner in which the tuberiferous roots are produced in *Hydrocotyle Americana* and *H. prolifera.*

On a New Horizon in the St. John Group. G. F. Matthew. (Can. Rec. Sci. iv. 339-343).

Contains an interesting discussion in regard to the probable position of the disputed organism *Dictyonema*, whether as plant or animal.

Pentstemon Haydeni, n. sp. Sereno Watson. (Bot. Gaz. xvi. 311).

Description of a new species, from Wyoming and Nebraska.

Phacelia campanularia. (West Am. Sci. vii. 270).

The fact is noted that this California plant has received a first class certificate from the Royal Horticultural Society of England, where it was recently introduced.

Pleurothallis immersa. J. D. Hooker. (Bot. Mag. t. 7189).

Picea pungens. (Gard. Chron. x. 547, f. 73, 74).

Ravenelia from Alabama—A new. G. F. Atkinson. (Bot. Gaz. xvi. 313, 314).

Ravenelia Cassiæcola is described as new.

Sling-Fruit of Cryptotænia Canadensis—The. E. J. Hill. (Bot. Gaz. xvi. 299-302).

An account of the manner in which this species disseminates its fruit by mechanical action.

Talauma macrocarpa, Zucc., the Yoloxochitl. Alfonso L. Herrera. El Estudio [Mexico], Tom. iv. No. 4.

The botanical and medical history of the plant is given.

Triassic Plants from New Mexico—Notes On. Wm. M. Fontaine and F. A. Knowlton. (Proc. U. S. Nat. Mus. xiii. 281-285, Pl. xxii-xxvi).

Two new species are described and figured, *Equisetum Abiquiense* and *E. Knowltoni. Zamites Powellii* is also figured as a new species. Its affinities are with *Z. occidentalis* and *Z. Feneomis.*

Vitality of Some Annual Plants—On the. Theo. Holm. (Reprint, Am. Journ. Sci. xlii. 304-307, Pl. x).

The author refers to the fact that some annual plants at times fluctuate in their cycle of life so as to appear biennial or even perennial, according to environment. *Hypericum nudicaule,* Walt., *Delphinium Consolida,* L., *Cyperus flavescens,* L., *Carex cyperoides,* L., *Tragus racemosus,* Hall, *Arabis dentata,* T. and G., *A. lyrata,* L., and *A. laevigata,* Poir., are noted.

Vegetation of "Burns"—The. T. S. Brandegee. (Zoë, ii. 118-122).

An interesting contribution to the literature of "fire weeds."

Viburnum. H. H. Rusby. (Reprint from Drug. Bull. July, 1891, illustrated).

Viburnum prunifolium is described and figured.

What the Station Botanists are Doing. B. D. Halsted. (Bot. Gaz. xvi. 288-291).

Winter Studies of the Pine Barren Flora of Lake Michigan, I—VI. E. J. Hill. (Gard. and For. iv., 159, 160; 195, 196; 208; 232, 234, 278, 279; 304).

Mention is made of *Celastrus scandens, Rhus Toxicodendron, R. typhina, R. Canadensis, Rosa blanda, R. humilis, R. Caroliniana, R. Engelmanni, Arctostaphylos Uva-Ursi, Cassandra calyculata, Vaccinium macrocarpon, Chimaphila maculata, C. umbellata, Gaultheria procumbens, Mitchella repens, Pyrola rotundifolia, P. elliptica, P. chlorantha, P. secunda, Cornus Canadensis, Linnæa borealis, Gaylussacia resinosa, Vaccinium corymbosum. V. vacillans, V. Pennsylvanicum* and *Rubus*

hispidum, either in regard to their fruit or evergreen leaves. Amongst the mosses and lichens to which attention is called in this article are *Cladonia rangiferina*, *Ceratodon purpureus*, *Polytrichum commune* and *Thelia Lescurii*. The forest trees are described.

Yucca rupicola. J. G. Baker. (Bot. Mag. t. 7172).

Yucca filifera. J. G. Baker. (Bot. Mag. t. 7197).

Proceedings of the Club.

Meeting of November 10th, 1891.

Mr. Hogg in the chair and twenty-two persons present.

The following were elected active members:

Miss Alice L. Sterne, Mrs Annie Chambers Ketcham and Mr. J. E. Torrey.

The following resolutions were adopted by the Club and a copy ordered to be sent to Mrs. Northrop.

In view of the death on June 26th, 1891, of John I. Northrop, a member of this Club and Instructor in Zoölogy in Columbia College,

Resolved (1), That we put on record our high sense of his simple, earnest and straightforward manliness, his ardor and indefatigable industry in the pursuit and study of natural science, and the great loss which our own department as well as that of zoölogy, has sustained in the early departure of one who gave promise of reaching the highest attainments.

(2), That we extend our sincere sympathy to his bereaved widow and family friends, and to all our fellow scientists, who in common with ourselves lament his sad and untimely end.

The paper announced for the evening, "The Flora of the Higher Catskills," was then read by Dr. Rusby, illustrated by specimens of most of the species alluded to.

Meeting of November 25th, 1891.

Mr. Hogg in the chair and twenty-seven persons present.

The following were elected active members:

Mr. Jacob M. Rich and Mrs. Helen Cooley.

The announced paper of the evening on "Recent Discoveries Concerning Lichens," was read by Dr. Emily L. Gregory.

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IN view of a contemplated special investigation of the genus *Astragalus* (including *Phaca*, *Diplotheca*, *Homolobus*, *Podolobus*), Mr. E. P. Sheldon, Assistant in Botany at the University of Minnesota, in Minneapolis, U. S. A., desires specimens of this genus from all parts of the world. In exchange he offers either fungi or flowering plants from the valley of the Minnesota River, which derives a peculiar interest from its position as the *central* drainage system of the continent of North America.

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The Index to Vol. XVIII will be issued with the January BULLETIN.
The subscriptions to Vol. XIX, BULLETIN, and Vol. III, MEMOIRS are now due.

VOL. XVIII. DECEMBER, 1891. No. 12.

BULLETIN

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EDITED BY

NATHANIEL LORD BRITTON,

AND OTHER MEMBERS OF THE CLUB.

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